

Biospheres

Standard 3240-0201

Introduction

Students will design a system which will actually be balanced and which could sustain life.

Human Biosphere

Materials

- 18"x24" paper
- pencil
- ruler
- compass
- protractor

Scenario

The earth is in serious jeopardy. Soon the only inhabitable place will be the biosphere which you design and build. It must be able to hold 8 people to begin with. The materials which you need for expansion must be nearby. All conditions to support and feed these people must be within the biosphere. You must plan for at least a five year stay. The people who stay in your biosphere will be the only ones who will be able to pass knowledge onto the next generations. You will need to consider what kind of skills and knowledge these people will need to have. Also you should consider their age. Within the biosphere you will need to consider how you will repair and maintain the vital systems within the biosphere. People to research and solve problems before they get too serious and can maintain the systems and keep them operating.

Resources

[Biospherics](#) has information about the Biosphere 2 and what was involved in having people live in that contained system.

Report

Your report must include a list of plants, animals, and other organisms that you will have in the biosphere as well as how much of each you will bring in. (Be careful to get organisms from all the different types producers, consumers, and decomposers). You will need to include drawings which give the dimensions and approximate size of your biosphere. Your drawings need to consist of a floor plan and an outside drawing. The website listed above will help you to get an idea of what is expected. Also remember to include how you will keep your biosphere clear of waste and with fresh water and air, along with how you will maintain your food supply.

Notes to Teacher

Be careful to help students analyze whether or not their biosphere is balanced. The following is a list of questions students should be able to answer in their report. How much food will you consume each day? How much food will you need to bring in with you? What will you need to support the animal life in the biosphere? What will you need to support the plant life in the biosphere? How much food do expect to be able to grow within your biosphere? If you bring in other large predators what impact will they have on the biosphere?

Assesment Rubric

4- All components are present and you are able to answer all of the above questions. Your drawings are neat and have dimensions listed as well as the location of all the major components of your bioshere. You are able to defend your biosphere and why you think you would be able to survive.

3- All components are present you can answer most of the teachers questions and defend most of your components. Drawings are neat but lacking some major systems as well as missing parts of the required elements.

2- Missing components of your biosphere you are only able to answer 1/2 of the teachers questions and defend 1/2 of your systems. Drawings are O.K. but do not have listed all of the needed systems. You are not able to show that you could survive.

1- Missing major components of your biosphere. You can answer less than half the teachers questions and cannot defend your systems. Drawings are poor and do not list most of the needed system. You cannot defend your ability to survive in your biosphere.

Bottle Biosphere

The following activity is an assesment variation off of the core experiment "[Making a Bottle Ecosystem](#)"

Materials

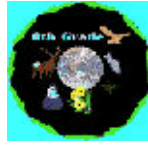
- bottle (2L pop, gallon glass jar, 5 gallon water bottle or whatever else you can find)
- plants(algae, duck weed, small house plants, weeds, or whatever they can find),
- animals (fish, crickets, snails, pill bugs, or worms)
- soil
- rocks



- water
- something else that the student wants to put in it.
- tape
- marker

Procedure / Assessment

Students go home and build an ecosystem which they feel contains all the components needed for the life in the ecosystem to survive. They seal it up with tape and bring it to school. Students then write their name and the date across the top in such a way that the ecosystem cannot be opened and resealed without showing. The ecosystem is left in the classroom for two weeks and then students have to analyze their ecosystem. If it survives the student understands the concept of ecosystem and therefore needs no more work. If it does not survive they must write an autopsy report which must explain why their ecosystem did not survive. If a student is able to report why their ecosystem did not survive they also have demonstrated that they understand how an ecosystem works. This is a great assessment tool at the end of a unit on ecosystems.



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Updated August 7, 2000 by: [Glen Westbrook](#)

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